PATENT COOPERATION TREATY

REC'D 28 JUL 2005
WIPO PCT

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

4/8

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

	Date of mailing *(day/month/year)* see form PCT/ISA/210 (second sheet)
Applicant's or agent's file reference see form PCT/ISA/220	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IB2005/050258	21.01.2005	22.01.2004

International Patent Classification (IPC) or both national classification and IPC
G06F15/78, H04Q7/32, G06F15/80

Applicant
KONINKLIJKE PHILIPS ELECTRONICS, N.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Authorized Officer
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Form (PCT/ISA/237) (Cover Sheet) (January 2004)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/IB2005/050258

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☐ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☐ in written format

   ☐ in computer readable form

   c. time of filing/furnishing:

   ☐ contained in the international application as filed.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-12
	No:	Claims	
Inventive step (IS)	Yes:	Claims	7,8
	No:	Claims	1-6,9-12
Industrial applicability (IA)	Yes:	Claims	1-12
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V.

1 Reference is made to the following documents:

D1: WO 02/50700 A (PICOCHIP DESIGNS LIMITED; CLAYDON, ANTHONY, PETER, JOHN) 27 June 2002 (2002-06-27)
D2: SOFTWARE DEFINED RADIO FORUM: "Requirements for Radio Software Download for RF Reconfiguration" NN, [Online] 13 November 2002 (2002-11-13), XP002335657 Retrieved from the Internet: URL:http://www.sdrforum.org/public/approved/02_a_0007_v0_00_dl_req_01_22_03.pdf> [retrieved on 2005-07-12]
D3: US-B1-6 282 627 (WONG DALE ET AL) 28 August 2001 (2001-08-28)
D4: US-A-6 047 115 (MOHAN ET AL) 4 April 2000 (2000-04-04)

2 CLARITY

2.1 The application does not meet the requirements of Article 6 PCT, because claims 1 and 9 are not clear.

2.2 Claims 1 and 9 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claims attempt to define the subject-matter in terms of the result to be achieved (namely reconfiguration "in real-time or near real-time"), which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.

3 INDEPENDENT CLAIMS 1 AND 9

3.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

3.2 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1 and discloses (references in brackets refer to D1 or to features implicitly known from well-known features of Software Radio receivers as referred to by D1 on page 5, line 33-36 (see e.g. D2)) :

"A signal processing apparatus (implicitly disclosed in D1 on page 2, line 23, "handset" & page 5, lines 33-36: the array-type processor disclosed is to be used in a handheld Software Radio receiver) *for use in a high speed digital communication system* (page 2, lines 11-18, "3G mobile"), *said signal processing apparatus performing predefined signal processing functions* (e.g, page 2, line 15, "FDD"), *comprising:*

- *an input receiving input digital information,*
- *an array-type processor configured to execute signal processing function code using said input digital information, said function code corresponding to at least one of said predefined signal processing functions responsive to a current system state* (page 15, lines 25-29 & page 17, line 6-7 & fig. 1, 7)*;*
- *at least one system controller configured to:*
  - *detect a change of said system state in said high speed digital communication system* (implicitly disclosed in D1: this is a key feature of a Software Radio receiver, see e.g. D2, page 23, section 4.2.2)*; and*
  - *dynamically reconfigure said array-type processor* (implicitly disclosed in D1: this is a key feature of a Software Radio receiver, see e.g. D2, page 23, section 4.2.2), *to execute signal processing function code* (page 17, lines 10-11) *corresponding to at least one of said signal processing functions responsive to said detected change of system state."*

3.3 The subject-matter of claim 1 therefore differs from this known signal processing apparatus in that the reconfiguration takes place in real-time. The known signal processing apparatus is only able to modify one instruction in the instruction store per cycle (see D1: first two rows in table on page 18).

3.4 The problem to be solved by the present invention may therefore be regarded as how to reconfigure a signal processing apparatus without noticeable effects to the user of this device.

3.5 The solution proposed in claim 1 of the present application, namely a reconfiguration in real-time, cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons.

The feature of reconfiguring an array-type processor in real-time has already been employed for the same purpose in a similar signal processing apparatus, see document D3 (col 6, lines 28-38, "on the fly"). It would be obvious to the person skilled in the art, namely when the same result is to be achieved, to apply these features with corresponding effect to a signal processing apparatus according to document D1, thereby arriving at a signal processing apparatus according to claim 1.

3.6 The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claim 9, which therefore is also considered not inventive.

4 DEPENDENT CLAIMS 2-6 AND 10-12

4.1 The following dependent claims do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step. In detail:

4.2 Regarding claims 2 and 12, document D1 also discloses an array-type processor which is comprised of a plurality of data processors (page 7, line 20, "execution array element" & fig. 1), wherein each of said data processors includes a dedicated program memory (page 13, line 30, "instruction store" & fig. 7) configured to store signal processing function code, and wherein said plurality of data processors are operative to execute said signal processing function code.

4.3 Regarding claims 3 and 11, the array-type processor disclosed in D1 downloads its program from a host processor (page 18, lines 14-16). It is implicitly clear that this host processor has stored this program in a memory which is external to the array-type processor.

4.4 Regarding claims 4 and 5, the insertion of buffers is a slight constructional change which comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen.

4.5 Regarding claim 5, the organization of a memory in memory banks is a standard

feature of state-of-the-art computer systems.

4.6 Regarding claim 10, detecting a change of state in accordance with channel and system data or in accordance with a protocol or in accordance with input data is a standard feature of all Software Radio receivers, see e.g. document D2, page 23, section 4.2.2.

5 DEPENDENT CLAIMS 7 AND 8

5.1 The combination of the features of dependent claims 7 and 8 taken together is neither known from, nor rendered obvious by, the available prior art. The reasons are as follows:

- Documents D3 and D4 disclose that an array-type processor can be reconfigured in real-time by switching between memory planes. However, these memory planes do not contain instructions to be executed, but configuration bits. Further, the re-configuration does not take place by switching between memory banks, but by copying in real-time the contents of a memory plane into the local configuration memories of the individual processors.

- Switching between memory banks is often used in data communications, e.g. in the form of ping-pong buffers. But in these cases the switched data is application data and not instructions to be executed by a processor.

- Switching between memory banks is also used to speed up access to a main memory which stores instructions, but in these cases the instructions fetched are taken from the same program.

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